

## AMENDMENTS TO THE CLAIMS

1. (Currently Amended) Hydroxyapatite (HA) incorporating an alpha-emitting radionuclide selected from the group consisting of  $^{211}\text{At}$ ,  $^{212}\text{Bi}$ ,  $^{223}\text{Ra}$ ,  $^{224}\text{Ra}$ ,  $^{225}\text{Ac}$ , and  $^{227}\text{Th}$  or an *in vivo* generator for an alpha-emitting radionuclide selected from the group consisting of the beta-emitting radionuclides  $^{212}\text{Pb}$ ,  $^{211}\text{Pb}$ ,  $^{213}\text{Bi}$ , and  $^{225}\text{Ra}$ .
- 2-4. (Cancelled)
5. (Currently Amended) Hydroxyapatite according to ~~any one of claims 1 to 4~~ claim 1, wherein the HA comprises a cation that is bivalent or trivalent or a mixture of such cations.
6. (Original) Hydroxyapatite according to claim 5 wherein the cation is chosen from the group consisting of calcium, strontium, barium, bismuth, yttrium, lanthanum, lead or mixtures thereof.
7. (Currently Amended) Hydroxyapatite according to ~~any one of claims 1 to 6~~, claim 1, wherein the HA is particulate and has a size in the range of 1 nm to 100  $\mu\text{m}$ .
8. (Original) Hydroxyapatite according to claim 7 wherein the HA has a size in the range of 1  $\mu\text{m}$  to 20  $\mu\text{m}$ .
9. (Currently Amended) Hydroxyapatite according to ~~any one of claims 1 to 8~~ claim

- 1, wherein the HA is surface modified with amino acids, peptides, proteins, antibodies, carbohydrates, phosphonates, fluorine, magnetic substances, folate groups or a combination thereof.
10. (Currently Amended) Hydroxyapatite according to ~~any one of claims 1 to 9~~ claim 1, wherein the HA is combined or co-sedimented with a substance selected from the following group: metals, oxides, proteins, amino acids, carbohydrates, phosphonates including bisphosphonates or organic compounds.
11. (Currently Amended) Hydroxyapatite according to ~~any one of claims 1 to 9~~ claim 1, wherein the HA is combined or co-sedimented with a substance selected from polylactide, polyethyleneketones, glass-ceramics, titania, alumina, zirconia, silica, polyethylene, epoxy, polyethyleneglycol, polyhydroxybutyrate, gelatin, collagen, chitosan, phosphazene, iron, iron oxides, magnetic iron or mixtures thereof.
12. (Withdrawn-Currently Amended) A process for preparing a ~~radionuclide-labeled hydroxyapatite particulate~~ hydroxyapatite according to claim 1, said process comprising:
- (a) contacting a solution of an alpha-emitting radionuclide selected from the group consisting of  $^{211}\text{At}$ ,  $^{212}\text{Bi}$ ,  $^{223}\text{Ra}$ ,  $^{224}\text{Ra}$ ,  $^{225}\text{Ac}$ , and  $^{227}\text{Th}$  or an *in vivo* generator of an alpha-emitting radionuclide selected from the group consisting of the beta-emitting radionuclides  $^{212}\text{Pb}$ ,  $^{211}\text{Pb}$ ,  $^{213}\text{Bi}$ , and  $^{225}\text{Ra}$  with hydroxyapatite

particulates; and

(b) optionally crystallizing a coating of hydroxyapatite on the labeled particulates prepared in step (a) whereby to encapsulate said radionuclide or said *in vivo* generator in the particulate.

13. (Withdrawn) A process as claimed in claim 12 wherein step (a) is carried out at a pH in the range 3-12.

14. (Withdrawn) A process as claimed in claim 12 or claim 13 wherein said *in vivo* generator of an alpha-emitting radionuclide is  $^{212}\text{Pb}$  and, prior to steps a) and b), said method additionally comprises;

i) Preparing  $^{224}\text{Ra}$ ,

ii) Purifying the  $^{224}\text{Ra}$  by contact with an f-block specific binder ,

iii) Allowing ingrowth of  $^{212}\text{Pb}$ , and

iv) Purifying the resulting  $^{212}\text{Pb}$  by contact with a lead-specific binder

15. (Currently Amended) A pharmaceutical composition comprising a hydroxyapatite as claimed in ~~any one of claims 1 to 11~~ claim 1 and a physiologically acceptable carrier.

16. (Original) A pharmaceutical composition according to claim 15 in liquid,

injectable form.

17. (Original) A pharmaceutical composition according to claim 15 in gel form.

18-23. (Cancelled)

24. (Withdrawn-Currently Amended) A method of radiochemical treatment of a human or non-human animal subject in need thereof, said method comprising administering to said subject an effective amount of a hydroxyapatite as claimed in ~~any one of claims 1 to 14~~ claim 1 or of a composition as claimed in ~~any one of claims 15 to 17~~ claim 15.

25. (Withdrawn) A method as claimed in claim 24 for the treatment of an intracavitary primary or metastatic tumor.

26. (Withdrawn) A method as claimed in claim 24 for radiosynovectomy.

27. (Withdrawn) A method as claimed in claim 24 for intratumor therapy.

28. (Withdrawn) A method as claimed in claim 24 for anticancer therapy.

29. (Withdrawn) A method as claimed in claim 24 for anticancer treatment and/or sterilization of tumor bed and optionally the cavity in the case of an intracavitary tumor, wherein said administration is effected after surgical removal of at least part of a tumor.